UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/774,917 | 02/06/2004 | Peter C. Zahrobsky | 200401024-1 | 8858 |

22879 7590 04/10/2009

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

| EXAMINER | |
|---|---|
| SHEWAREGED, BETELHEM | |
| ART UNIT | PAPER NUMBER |
| 1794 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 04/10/2009 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JERRY.SHORMA@HP.COM
ipa.mail@hp.com
jessica.l.fusek@hp.com

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

---

*Ex parte* PETER C. ZAHROBSKY, MATTHEW THORNBERRY, PALITHA WICKRAMANAYAKE, URS FUERHOLZ, LINDA C. UHLIR-TSANG, and ERIC L. BURCH

---

Appeal 2008-4988
Application 10/774,917
Technology Center 1700

---

Decided:[1] April 08, 2009

---

Before JEFFREY T. SMITH, LINDA M. GAUDETTE, and MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

---

[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

## STATEMENT OF THE CASE

Appellants seek review under 35 U.S.C. § 134 from the Examiner's rejections of claims 14-23 and 25-30 in the final Office Action dated June 14, 2007. This Board has jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

The invention of the present application is directed to an ink jet print medium. Claim 14, 15, 22, and 23 are illustrative and reproduced below:

14. A print medium, comprising:

a) a media substrate; and

b) an ink-receiving layer applied to the media substrate, said ink-receiving layer comprising:

i) a dispersion of inorganic particulates;

ii) a polymeric binder; and

iii) gas generated bubbles located within the ink-receiving layer, wherein the gas generated bubbles are generated by reacting an acid with a weak base comprising a salt of an alkali metal and a weak acid, and wherein the alkali metal is present in the ink-receiving layer at from about 0.4 wt% to about 10 wt%.

15. A print medium as in claim 14, wherein the ink-receiving layer contains excess amounts of the acid.

22. A print medium as in claim 14, wherein the pH of the ink-receiving layer is from about 2.0 to about 6.0.

23. A print medium as in claim 22, wherein the pH of the ink-receiving layer is from about 3.0 to about 4.5.

The Examiner cites the following prior art as evidence of the obviousness of the rejected claims:

| | | |
|---|---|---|
| Schliesman | 6,129,785 | Oct. 10, 2000 |
| Ohbayashi | 6,492,005 B1 | Dec. 10, 2002 |
| Koyano | US 2003/0064206 A1 | Apr. 03, 2003 |

The Examiner maintains the following rejections of the pending claims:

1. Claims 14-23 and 25-30 stand rejected under 35 U.S.C. § 103(a) as obvious over Ohbayashi in view of Schliesman and Koyano.

In traversing the rejection, Appellants argue claims 14, 16-21, and 25-30 as a group. We select claim 14 as representative of the group because it contains the features argued by Appellants. Appellants further argue claims 15, 22, and 23 separately. Therefore, we separately address Appellants' arguments regarding the rejection of claims 15, 22, and 23.[2] 37 C.F.R § 41.37(c)(1)(vii) (2007).

*Independent Claim 14*

With regard to claim 14, Appellants contend the prior art does not disclose a print medium with an alkali metal in the claimed range of 0.4 wt% to about 10 wt% (App. Br. 15). Appellants contend that optimizing the amount of potassium carbonate to achieve a desired pH would not include the claimed range of alkali metal used to generate bubbles (Reply Br. 8). Appellants further contend the applied prior art does not teach a print

[2] We find it unnecessary to address the Koyano reference because the Examiner applied Koyano for its teaching to use lithium carbonate as a pH adjusting agent, which is the subject matter of non-argued claim 21 (Ans. 4; App. Br. 14-19).

medium with generated gas bubbles. Appellants contend the prior art discloses use of boric acid as a hardener, and is intended to react with polyvinyl alcohol binder, not potassium carbonate (App. Br. 16-19). Appellants argue that Ohbayashi does not teach the use of potassium carbonate and boric acid together and the Examiner has merely chosen boric acid and potassium carbonate from among hundreds of possible combinations (App. Br. 17). Appellants argue that Ohbayashi teaches away from the combination of boric acid and potassium carbonate because if boric acid and potassium carbonate were combined it would destroy the function of Ohbayashi by frustrating the hardening process (App. Br. 17).

The Examiner finds the Ohbayashi teaches that potassium carbonate, a weak base and an alkali metal salt, may be used to adjust the pH of the recording medium coating (Ans. 3-4). The Examiner further finds that Schliesman teaches the pH of ink absorptive layers controls the stability and viscosity of the composition that would form the recording layer (Ans. 4). Based on these findings, the Examiner determines that it would have been obvious to adjust the amount of the potassium carbonate so as to control the pH value of the layer (i.e., optimization of a result effective variable) (Ans. 4 and 5).

With regard to gas bubble formation, the Examiner finds that generated gas bubbles are inherent in the prior art disclosures, because Ohbayashi discloses potassium carbonate and boric acid, which would have been known in the art to react to produce gas (Ans. 5). The Examiner further finds that Appellants have not provided any factual evidence that boric acid would not react with the potassium carbonate to generate gas bubbles (Ans. 6).

## ISSUES

(1) Have Appellants shown the Examiner reversibly erred in determining that it would have been obvious for a person of ordinary skill in the art, in light of Schliesman's teachings, to vary the amount of pH adjustor (i.e., potassium carbonate) in Ohbayashi to include the amount of alkali metal recited in claim 14 so as to control the pH of the layer?

(2) Have Appellants shown that the Examiner reversibly erred in determining that Ohbayashi does not teach away from the combination of boric acid and potassium carbonate in the composition?

(3) Have Appellants shown the Examiner reversibly erred in finding that Ohbayashi's boric acid hardener would inherently react with the potassium carbonate to generate gas bubbles?

We decide these issues in the negative.

## FINDINGS OF FACT (FF)

1. Ohbayashi discloses an ink jet recording sheet with a porous ink absorptive layer (col. 3, ll. 48-53). The absorptive layer comprises, *inter alia*, a binder, preferably polyvinyl alcohol (PVA) (col. 14, ll. 3-4).
2. Ohbayashi discloses when PVA is used as a binder, preferably a hardener such as boric acid or its salts is also present in the absorptive layer (col. 15, ll. 46-52).
3. Ohbayashi states the absorption layer may include other additives, such as pH adjusting agents (i.e., acids or bases) (col. 16, ll. 16-18, ll.

29-34). One suitable pH adjusting agent is potassium carbonate (col. 16, l. 32).

4. Ohbayashi discloses that a hardener may be used to obtain glossiness and a high void ratio without degrading layer brittleness of the coating composition (col. 15, ll. 24-27).
5. Schliesman discloses an ink jet recording medium with an ink receptive coating applied to one or both sides of the medium (col. 1, ll. 45-46). The coating composition preferably has a pH in the range of 4.5-5.5. Coatings with these pH values have improved hold-out of the ink dyes on the paper surface as compared to alkaline coatings having pH values of 8.0- 9.0 (col. 2, ll. 47-52).
6. Schliesman discloses that an acid may be added to decrease the pH and a base may be added to increase the pH (col. 2, ll. 61-63).
7. The Specification states that, "[i]n order to bind the inorganic particulates together in the coating composition, a polymeric binder is typically included. Exemplary polymeric binders that can be used include polyvinyl alcohol" (Spec. 8, ll. 17-19).
8. The Specification states, "[i]n one embodiment of the present invention, for example, the weak base reacts with the acid to form $CO_2$ bubbles. Examples of weak bases that generate $CO_2$ in the presence of an acid include alkali salts of carbonates" (Spec. 9, ll. 14-17).
9. The Specification states, "[t]he alkali metal component of the salt can include any Group I metal on the periodical chart, namely, lithium, . . . potassium, . . . Accordingly, typical weak bases comprising salts

of an alkali metal and a weak acid can be used, including . . . potassium carbonate" (Spec 9, ll. 18-19, 21-24).

10. The Specification states, "an acid can be included in the coating composition to react with the weak base in order to form gas bubbles in the coating composition. The acid can include any composition that can lower or maintain the pH of the coating composition below about 7" (Spec. 9, ll. 29-32).

11. The Specification states, "[a]dditionally, the acid in the coating composition can be provided by an acidic cross linking agent, such as, but not limited to, boric acid" (Spec. 10, ll. 4-5).

## PRINCIPLES OF LAW

> Section 103 forbids issuance of a patent when "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."

*KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007).

> The analysis is objective: "Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this backdrop the obviousness or nonobviousness of the subject matter is determined."

*Id.* (quoting *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966)).

The "person of ordinary skill is also a person of ordinary creativity, not an automaton." *KSR*, 127 S. Ct. at 1742.

Where "general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller,* 220 F.2d 454, 456 (CCPA 1955). However, exceptions to this rule include if the results of optimizing a variable, known to be result effective, was unexpectedly good, or if a parameter optimized was not recognized as a result-effective variable, *In re Antonie,* 559 F.2d 618, 620 (CCPA 1977).

"Where, as here, the claimed and prior art products are identical or substantially identical . . . the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product." *In re Best,* 562 F.2d 1252, 1255 (CCPA 1977).

> Whether the rejection is based on 'inherency' under 35 U.S.C. § 102, on 'prima facie obviousness' under 35 U.S.C. § 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products.

*Id.*

A patent that "discloses a multitude of effective combinations," including those claimed by applicant, "does not render any particular formulation less obvious." *Merck & Co., Inc. v. Biocraft Labs,* 874 F.2d 804, 807 (Fed. Cir. 1989) (citing *In re Corkill,* 771 F.2d 1496, 1500 (Fed. Cir. 1985) (affirming obviousness rejection in view of prior art teaching that "hydrated zeolites will work" in detergent formulations, even though "the inventors selected the zeolites of the claims from among 'thousands' of compounds")). Picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference may be

entirely proper in making a § 103 rejection, but it is not appropriate in making a § 102 rejection. *In re Arkley*, 455 F.2d 586, 587-88 (CCPA 1972).

A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). The degree of teaching away will of course depend on the particular facts; in general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant. *Id.*

## ANALYSIS

*I. Have Appellants shown the Examiner reversibly erred in determining that it would have been obvious for a person of ordinary skill in the art, in light of Schliesman's teachings, to vary the amount of pH adjustor (i.e., potassium carbonate) in Ohbayashi to include the amount of alkali metal recited in claim 14 so as to control the pH of the layer?*

The Examiner found that Ohbayashi discloses a coating for a printing medium that may contain boric acid, and potassium carbonate (i.e., a weak base and alkali metal salt) (Ans. 3). Ohbayashi further discloses that potassium carbonate or an acid may be used to adjust the pH of the coating.

Schliesman discloses a low pH coating for an ink jet recording medium. Schliesman discloses that the pH of the coating is controlled by adding acid to decrease the pH or a base to increase the pH in order to achieve the desired pH range of 4.5 to 5.5. Schliesman discloses that a pH within the 4.5-5.5 range provides a more stable coating composition.

Ohbayashi and Schliesman both recognize that acids and bases maybe added to control the pH of the coating composition. Ohbayashi discloses that potassium carbonate is a suitable pH adjusting compound. Accordingly, the teachings of the references, as a whole, would have suggested that potassium carbonate may be used to adjust the pH of the coating composition.

Moreover, both Ohbayashi and Schliesman recognize that the amount of acid or base is a result-effective variable for controlling the pH, such that it would have been obvious to optimize the amount of base (i.e., potassium carbonate) and acid added to the coating composition, which includes the claimed alkali metal range of 0.4 wt% to about 10wt%, in order to achieve the desired pH. *Antonie*, 559 F.2d at 620.

Appellants contend that Ohbayashi discloses a "laundry list" of additives to the coating composition, which may include potassium carbonate, such that the claimed amount of alkali metal is not taught or suggested (App. Br. 15). That Ohbayashi discloses that potassium carbonate, a pH adjustor, may be added to the coating composition along with other additives does not render the use of potassium carbonate as a pH adjustor any less obvious. *Merck*, 874 F.2d at 807.

We are unpersuaded by Appellants' argument that optimizing the potassium carbonate (i.e., alkali metal) amount to achieve a desired pH would not result in the claimed alkali metal range used for bubble formation. Appellants appear to argue that their reason for arriving at the claimed alkali metal range (i.e., gas bubble formation) is different than the Examiner's reason for optimizing to achieve the claimed alkali metal range (i.e., pH adjustment). However, it is well settled that any need or problem known in

the field of endeavor may provide a reason for the modification (e.g., optimization of a result effective variable). *KSR*, 127 S.Ct. at 1742.

Appellants have not shown the Examiner reversibly erred in determining that it would have been obvious to optimize the range of alkali metal to include the claimed range of 0.4 wt% to about 10 wt%.

*II. Have Appellants shown the Examiner reversibly erred in determining that Ohbayashi does not teach away from the combination of boric acid and potassium carbonate?*

Ohbayashi plainly discloses that the composition may include hardeners, such as boric acid, to obtain excellent glossiness and high void ratio without degrading layer brittleness. Ohbayashi further discloses that the composition may include additives, such as pH adjusting agents that include potassium carbonate.

Accordingly, Ohbayashi does not teach or suggest that combining boric acid and potassium carbonate in a composition is unlikely to result in the hardened layer sought so as to constitute a teaching away. To the contrary, Ohbayashi plainly suggests that various additives, including boric acid and potassium carbonate, may be combined to produce a suitable recording layer composition. That there may be "hundreds" of combinations as argued by Appellants (App. Br. 17), does not render any particular combination less obvious. *Merck*, 874 F.2d 807. Moreover, picking and choosing among various disclosures within a reference may be entirely proper for a § 103 rejection. *Arkley*, 455 F.2d at 587-88.

Appellants' arguments focus on Ohbayashi's failure to "teach the use of potassium carbonate and boric acid together" (App. Br. 17). However, such an argument improperly focuses on whether Ohbayashi anticipates

Appellants' claimed invention. The proper inquiry under § 103 is whether the claimed subject matter as a whole would have been obvious.

Appellants' argument that combining boric acid and potassium carbonate would destroy the hardening function of Obayashi is without persuasive merit. Appellants have not provided any evidence, other than attorney argument, that such a combination would destroy the hardening ability of Ohbayashi's composition. To the contrary, Appellants' Specification indicates that boric acid may serve as cross-linking agent (i.e., a hardening agent) and as the acid to form the gas bubbles (FF 7-11).

We determine that Appellants have not shown that Ohbayashi teaches away from using boric acid and potassium carbonate together.

*III. Have Appellants shown the Examiner reversibly erred in finding that Ohbayashi's boric acid hardener would inherently react with the potassium carbonate to generate gas bubbles?*

Appellants' claimed ink-receiving layer composition comprises, in relevant part, a polymeric binder, a weak acid and weak base (i.e., a salt of an alkali metal) that react to form gas bubbles (claim 14). Appellants disclose that the composition may contain a PVA binder with carbonate and that boric acid may be used as the acid to form the gas bubbles (FF 7-11).

The Examiner finds that Ohbayashi's coating composition would inherently produce gas bubbles because the boric acid and potassium carbonate would react to form a gas (Ans. 3). Ohbayashi discloses a print medium coating containing PVA binder, boric acid hardener and potassium carbonate (i.e., a weak base used as a pH adjusting agent) (FF 1-3).

As noted above with regard to Issue I, we agree with the Examiner that it would have been obvious in view of the teachings of Ohbayashi and Schliesman to optimize the amount of pH adjusting agent (i.e., potassium

carbonate) to include the claimed amount of alkali metal. In other words, once optimized, Ohbayashi's coating composition for a recording media appears to be identical to the claimed coating composition for a print media.

Because Appellants' claimed composition and Ohbayashi's optimized composition appear to be identical, the Examiner has presented a reasonable basis to believe that the potassium carbonate and boric acid of Ohbayashi's composition would inherently react to form the same gas bubbles claimed by Appellants. Appellants thus have the burden of showing that Ohbayashi's composition does not inherently possess the gas bubble characteristic. *Best*, 562 F.2d at 1255.

Attempting to show that Ohbayashi's composition does not inherently possess the gas bubble property, Appellants contend that the purpose of boric acid in Ohbayashi is as a hardener, to cross-link the polymers of the polyvinyl alcohol binder (FF 2). Appellants then posit that gas bubble generation is not inherent because either boric acid is consumed in hardening the PVA binder and not otherwise available to neutralize any potassium carbonate present, or else, if conditions can be made favorable for neutralization, such would frustrate and defeat the purpose of boric acid for hardening the PVA (App. Br. 16-17).

However, Appellants' argument fails to establish that boric acid would not react with the potassium carbonate to form both gas bubbles and harden the PVA. Ohbayashi discloses that potassium carbonate and boric acid may be added to the coating composition (FF 2 and 3). Ohbayashi does not indicate that adding the two components together would not have successfully produced a void-containing coating layer as desired by Ohbayashi (col. 13, ll. 33-35). Therefore, Appellants' arguments do not

persuade us that the Examiner reversibly erred in finding that the boric acid and potassium carbonate pH adjustor would react to form gas bubbles.

Rather, we determine the Examiner has provided a reasonable basis for determining that Ohbayashi's optimized composition would inherently generate gas bubbles in the disclosed prior art. Appellants have not satisfied their burden of showing that the prior art would not inherently possess this characteristic.

Appellants do not otherwise dispute the factual findings of the Examiner or the reasons for combining the teachings of the prior art references, and any such arguments are deemed waived.

*Claims 15, 22, and 23*

With regard to claims 15, 22, and 23, Appellants further argue that the applied prior art does not teach or suggest that the ink-receiving layer contains an excess of acid (claim 15), or that the pH of the ink-receiving layer is from about 2.0 to 6.0 (claim 22) or from about 3.0 to about 4.5 (claim 23) (App. Br. 18-19).

## ISSUE

(4) Have Appellants shown that the Examiner reversibly erred in determining that the subject matter of claims 15, 22, and 23 would have been obvious?

## ANALYSIS

We rely on the findings of facts and principles of law relied upon with regard to issue (1). For the same reasons noted above with regard to the first

issue, the applied prior art recognizes that the amount of acid or base is a result effective variable for controlling the pH of the sample. In fact, the teachings of Schliesman disclose that a more acidic pH provides a greater stability to the coating composition and that the amount of acid or base controls the pH of the composition. Therefore, in view of the combined teachings of Ohbayashi and Schliesman, it would have been obvious to optimize the amount of acid to achieve an excess amount of acid as recited in claim 15 to provide an acidic pH falling within the ranges recited in claims 22 and 23. *Antonie,* 559 F.2d at 620.

## CONCLUSIONS

1. Appellants have not shown the Examiner reversibly erred in determining that it would have been obvious for a person of ordinary skill in the art in light of Schliesman's teachings to adjust the amount of pH adjustor (i.e., potassium carbonate) in Ohbayashi so as to control the pH value of the layer as recited in claim 14.

2. Appellants have not shown that the Examiner reversibly erred in determining that Ohbayashi does not teach away from the combination of boric acid and potassium carbonate in the composition.

3. Appellants have not shown the Examiner reversibly erred in finding that Ohbayashi's boric acid hardener would inherently react with the potassium carbonate to generate gas bubbles.

4. Appellants have not shown that the Examiner reversibly erred in determining that the subject matter of claims 15, 22, and 23 would have been obvious.

ORDER

We affirm the Examiner's § 103 rejection of claims 14-23, and 25-30 over Ohbayashi in view of Schliesman and Koyano.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(v).

AFFIRMED

ssl

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400